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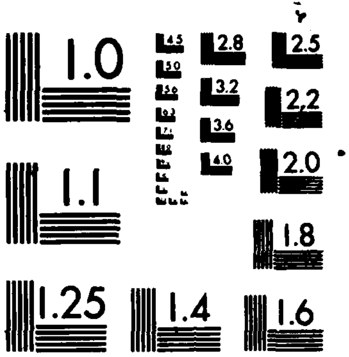

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AFWAL-TR-86-4006
Volume VIII
Part 33

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS)

Volume VIII - User Interface Subsystem
Part 33 - Application Interface Product Specification

General Electric Company
Production Resources Consulting
One River Road
Schenectady, New York 12345

Final Report for Period 22 September 1980 - 31 July 1985

November 1985

Approved for public release; distribution is unlimited.

MATERIALS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AFB, OH 45433-6533

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

A182 662

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION
Unclassified

1b. RESTRICTIVE MARKINGS

2a. SECURITY CLASSIFICATION AUTHORITY

2b. DECLASSIFICATION/DOWNGRADING SCHEDULE

3. DISTRIBUTION/AVAILABILITY OF REPORT
Approved for public release;
distribution is unlimited.

4. PERFORMING ORGANIZATION REPORT NUMBER(S)

5. MONITORING ORGANIZATION REPORT NUMBER(S)
AFWAL-TR-86-4006 Vol VIII, Part 33

6a. NAME OF PERFORMING ORGANIZATION
General Electric Company
Production Resources Consulting

6b. OFFICE SYMBOL *(If applicable)*

7a. NAME OF MONITORING ORGANIZATION
AFWAL/MLTC

6c. ADDRESS *(City, State and ZIP Code)*
-1 River Road
Schenectady, NY 12345

7b. ADDRESS *(City, State and ZIP Code)*
WPAFB, OH 45433-6533

8a. NAME OF FUNDING/SPONSORING ORGANIZATION
Materials Laboratory
Air Force Systems Command, USAF

8b. OFFICE SYMBOL *(If applicable)*
AFWAL/MLTC

9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
F33615-80-C-5155

8c. ADDRESS *(City, State and ZIP Code)*
Wright-Patterson AFB, Ohio 45433

10. SOURCE OF FUNDING NOS.

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT NO.
78011F	7500	62	01

11. TITLE *(Include Security Classification)*
(See Reverse)

12. PERSONAL AUTHOR(S)
Morenc, Carol, Barker, Sandy and Robie, Penny

13a. TYPE OF REPORT
Final Technical Report

13b. TIME COVERED
22 Sept 1980 - 31 July 1985

14. DATE OF REPORT *(Yr., Mo., Day)*
1985 November

15. PAGE COUNT
148

16. SUPPLEMENTARY NOTATION
ICAM Project Priority 6201
The computer software contained herein are theoretical and/or references that in no way reflect Air Force-owned or -developed computer software.

17. COSATI CODES

FIELD	GROUP	SUB. GR.
1308	0905	

18. SUBJECT TERMS *(Continue on reverse if necessary and identify by block number)*

19. ABSTRACT *(Continue on reverse if necessary and identify by block number)*

This specification establishes the detailed design of a computer program identified as the Application Interface. The AI is a collection of procedures that may be linked with an application to enable it to use the Form Processor (FP) and run in the distributed IISS environment. The AI does this by sending/receiving FP requests through the Network Transaction Manager to/from the User Interface Monitor of the FP.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT
UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. □ DTIC USERS □

21. ABSTRACT SECURITY CLASSIFICATION
Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL
David L. Judson

22b. TELEPHONE NUMBER *(Include Area Code)*
513-255-6976

22c. OFFICE SYMBOL
AFWAL/MLTC

EDITION OF 1 JAN 73 IS OBSOLETE.

Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

11. Title

Integrated Information Support System (IISS)
Vol VIII - User Interface Subsystem
Part 33 - Application Interface Product Specification

A S D 86 0044
9 Jan 1986

PREFACE

This product specification covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Alan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201 performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users. Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

TASK 4.2

Subcontractors	Role
Boeing Military Aircraft Company (BMAC)	Reviewer
D. Appleton Company (DACOM)	Responsible for IDEF support, state-of-the-art literature search
General Dynamics/ Ft. Worth	Responsible for factory view function and information models

Subcontractors	Role
Illinois Institute of Technology	Responsible for factory view function research (IITRI) and information models of small and medium-size business
North American Rockwell	Reviewer
Northrop Corporation	Responsible for factory view function and information models
Pritsker and Associates	Responsible for IDEF2 support
SofTech	Responsible for IDEF0 support

TASKS 4.3 - 4.9 (TEST BED)

Subcontractors	Role
Boeing Military Aircraft Company (BMAC)	Responsible for consultation on applications of the technology and on IBM computer technology.
Computer Technology Associates (CTA)	Assisted in the areas of communications systems, system design and integration methodology, and design of the Network Transaction Manager.
Control Data Corporation (CDC)	Responsible for the Common Data Model (CDM) implementation and part of the CDM design (shared with DACOM).
D. Appleton Company (DACOM)	Responsible for the overall CDM Subsystem design integration and test plan, as well as part of the design of the CDM (shared with CDC). DACOM also developed the Integration Methodology and did the schema mappings for the Application Subsystems.

Subcontractors	Role
Digital Equipment Corporation (DEC)	Consulting and support of the performance testing and on DEC software and computer systems operation.
McDonnell Douglas Automation Company (McAuto)	Responsible for the support and enhancements to the Network Transaction Manager Subsystem during 1984/1985 period.
On-Line Software International (OSI)	Responsible for programming the Communications Subsystem on the IBM and for consulting on the IBM.
Rath and Strong Systems Products (RSSP) (In 1985 became McCormack & Dodge)	Responsible for assistance in the implementation and use of the MRP II package (PIOS) that they supplied.
SofTech, Inc.	Responsible for the design and implementation of the Network Transaction Manager (NTM) in 1981/1984 period.
Software Performance Engineering (SPE)	Responsible for directing the work on performance evaluation and analysis.
Structural Dynamics Research Corporation (SDRC)	Responsible for the User Interface and Virtual Terminal Interface Subsystems.

Prime contractors under other projects who have contributed to Test Bed Technology, their contributing activities and responsible projects are as follows:

Contractors	ICAM Project	Contributing Activities
Boeing Military Aircraft Company (BMAC)	1701, 2201, 2202	Enhancements for IBM node use. Technology Transfer to Integrated Sheet Metal Center (ISMC)

Contractors	ICAM Project	Contributing Activities
Control Data Corporation (CDC)	1502, 1701	IISS enhancements to Common Data Model Processor (CDMP)
D. Appleton Company (DACOM)	1502	IISS enhancements to Integration Methodology
General Electric	1502	Operation of the Test Bed and communications equipment.
Hughes Aircraft Company (HAC)	1701	Test Bed enhancements
Structural Dynamics Research Corporation (SDRC)	1502, 1701, 1703	IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI)
Systran	1502	Test Bed enhancements. Operation of Test Bed.

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APPENDICES

FIGURES

SECTION 1

SCOPE

1.1 Identification

This specification establishes the detailed design of a computer program identified as the Application Interface, hereinafter referred to as AI. The AI is one configuration item of the Integrated Information Support System (IISS) User Interface (UI).

1.2 Functional Summary

The AI is a collection of procedures that may be linked with an application to enable it to use the Form Processor (FP) and run in the distributed IISS environment. The AI does this by sending/receiving FP requests through the NTM (Network Transaction Manager) to/from the User Interface Monitor (UIM) of the Form Processor. [illegible]

[illegible]

SECTION 2

DOCUMENTS

2.1 Reference Documents

[1] Structural Dynamics Research Corporation, Forms Driven Form Editor Product Specification, PS 620144402 , 1 November 1985.

[2] Structural Dynamics Research Corporation, Forms Language Compiler Product Specification, PS 620144401 , 1 November 1985.

[3] Structural Dynamics Research Corporation, Form Processor Product Specification, PS 620144200 , 1 November 1985.

[4] Structural Dynamics Research Corporation, Rapid Application Generator Product Specification, PS 620144502 , 1 November 1985.

[5] Structural Dynamics Research Corporation, Report Writer Product Specification, PS 620144501 , 1 November 1985.

[6] Structural Dynamics Research Corporation, Text Editor Product Specification, PS 620144600 , 1 November 1985.

[7] Structural Dynamics Research Corporation, User Interface Services Product Specification, PS 620144100 , 1 November 1985.

[8] Structural Dynamics Research Corporation, Virtual Terminal Product Specification, PS 620144300 , 1 November 1985.

[9] Structural Dynamics Research Corporation, Application Interface Development Specification, DS 620144700 , 1 November 1985.

[10] Structural Dynamics Research Corporation, Application Inteface Unit Test Plan, UTP620144700 , 1 November 1985.

2.2 Terms and Abbreviations

American Standard Code for Information Interchange: (ASCII), the character set defined by ANSI X3.4 and used by most computer vendors.

Application Definition Language: an extension of the Forms Definition Language that includes retrieval of database information and conditional actions. It is used to define interactive application programs.

Application Generator: (AG), subset of the IISS User Interface that consists of software modules that generate IISS application code and associated form definitions based on a language input. The part of the AG that generates report programs is called the Report Writer. The part of the AG that generates interactive applications is called the Rapid Application Generator.

Attribute: field characteristic such as blinking, highlighted, black, etc. and various other combinations. Background attributes are defined for forms or windows only. Foreground attributes are defined for items. Attributes may be permanent, i.e., they remain the same unless changed by the application program, or they may be temporary, i.e., they remain in effect until the window is redisplayed.

Buffer Name: the default file in which the buffer will be saved if no file is given on a save command.

Common Data Model: (CDM), IISS subsystem that describes common data application process formats, form definitions, etc. of the IISS and includes conceptual schema, external schemas, internal schemas, and schema transformation operators.

Conceptual Schema: (CS), the standard definition used for all data in the CDM. It is based on IDEF1 information modelling.

Current Cursor Position: the position of the cursor before an edit command or function is issued in the text editor.

Cursor Position: the position of the cursor after any command is issued.

Cut and Paste Buffer: where deleted lines go and the paste and fill edit commands get their data.

Device Drivers: (DD), software modules written to handle I/O for a specific kind of terminal. The modules map terminal specific commands and data to a neutral format. Device Drivers are part of the UI Virtual Terminal.

Display List: is similar to the open list, except that it contains only those forms that have been added to the screen and are currently displayed on the screen.

Display Start Line: the first line in the buffer to be displayed.

Display Size: the number of lines used in the edit area.

Extended Binary Coded Decimal Interchange Code: (EBCDIC), the character set used by a few computer vendors (notably IBM) instead of ASCII.

External Schema: (ES), an application's view of the CDM's conceptual schema.

Field Pointer: indicates the ITEM which contains the current cursor position.

Forms Driven Form Editor: (FDFE), subset of the FE which consists of a forms driven application used to create Form Definition files interactively.

Form Editor: (FE), subset of the IISS User Interface that is used to create definitions of forms. The FE consists of the Forms Driven Form Editor and the Forms Language Compiler.

Forms Language Compiler: (FLAN), subset of the FE that consists of a batch process that accepts a series of forms definition language statements and produces form definition files as output.

Form Processor Text Editor: (FPTE), subset of the Form Processor that consists of software modules that provide text editing capabilities to all users of applications that use the Form Processor.

Item: non-decomposable area of a form in which hard-coded descriptive text may be placed and the only defined areas where user data may be input/output.

Logical Device: a conceptual device which to an application is indistinguishable from a physical device and is then mapped to part or all of a physical device.

Neutral Data Manipulation Language: (NDML), the command language by which the CDM is accessed for the purpose of extracting, deleting, adding, or modifying data.

Open List: a list of all the forms that have been and are currently open for an application process.

Operating System: (OS), software supplied with a computer which allows it to supervise its own operations and manage access to hardware facilities such as memory and peripherals.

Page: instance of forms in windows that are created whenever a form is added to a window.

Paging and Scrolling: a method which allows a form to contain more data than can be displayed with provisions for viewing any portion of the data buffer.

Physical Device: a hardware terminal.

Presentation Schema: (PS), may be equivalent to a form. It is the view presented to the user of the application.

Previous Cursor Position: the position of the cursor when the previous edit command was issued.

Previous Edit Command: the function key pressed before the current one.

Rapid Application Generator: (RAP), part of the Application Generator that generates source code for interactive programs based on a language input.

Report Definition Language: an extension of the Forms Definition Language that includes retrieval and calculation of database information and is used to define reports.

Report Writer: (RW), part of the Application Generator that generates source code for report programs based on a language input.

Select Line: one terminus of the select range.

Select Mode: when on, certain commands will be executed over the lines in the selected range. The commands are ‹DELETE LINE› and replace.

Subform: a form that is used within another form.

Text Editor: (TE), subset of the IISS User Interface that consists of a file editor that is based on the text editing functions built into the Form Processor.

Top of file: the first line of the buffer.

User Interface Development System: (UIDS), collection of IISS User Interface subsystems that are used by applications programmers as they develop IISS applications. The UIDS includes the Form Editor and the Application Generator.

User Interface Monitor: (UIM), part of the Form Processor that handles messaging between the NTM and the UI. It also provides authorization checks and initiates applications.

User Interface Services: (UIS), subset of the IISS User Interface that consists of a package of routines that aid users in controlling their environment. It includes message management, change password, and application definition services.

Virtual Terminal Interface: (VTI), the callable interface to the VT.

Virtual Terminal Interface Field Map: defines the complete terminal screen by breaking it into pieces of the various forms and items that are displayed. Each area of the terminal screen must be defined as belonging to a particular field in the display list.

Window Manager: a facility which allows the following to be manipulated: size and location of windows, the device on which an application is running, the position of a form within a window. It is part of the Form Processor.

SECTION 3

REQUIREMENTS

3.1 Structural Description

Applications use the AI just as though they were using the User Interface Form Processor. The Application Interface routines have the same calling sequence as the FP routines, but instead of processing the commands the AI creates messages which are sent to the Form Processor by way of the Network Transaction Manager. The Form Processor then processes the command which is contained in the message. This structure allows the application program to run on a machine other than the host of the User Interface. The detailed structure of the Application Interface is illustrated in section 3.10. Figure 3-1 illustrates the relationship between the AI, NTM, FP and an application.

```
+-------------------+
|    application    |
|                   |
+-------------------+
|                   |
|        AI         |
+---------+---------+
          ^
          | messages
          |
          v
+---------+---------+
|                   |
|        NTM        |
+---------+---------+
          ^
          | messages
          |
          v
+---------+---------+
|                   |
|      UIM/FP       |
+-------------------+
```

Figure 3-1 AI Interfaces

3.2 Functional Flow

Figure 3-2 is a data flow diagram of the Application Interface.

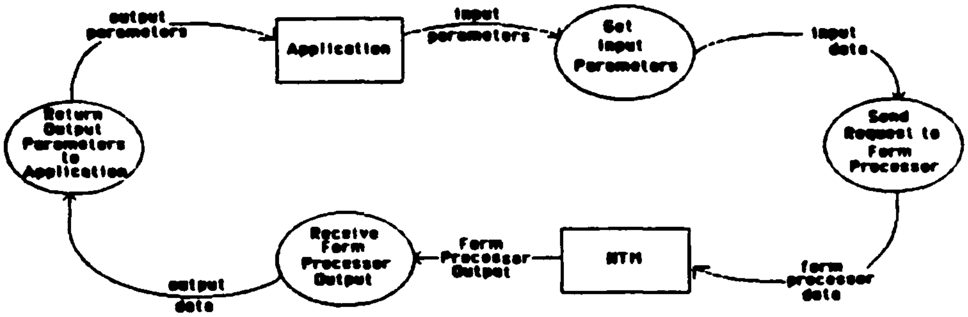

Figure 3-2 Application Interface Data Flow

3.3 Interfaces

3.3.1 Application Programs

The interface to the application is identical to that of the Form Processor procedures and is documented in the FP User Manual.

3.3.2 Network Transaction Manager

The AI sends and receives messages to and from the UIM via the NTM. Each FP procedure is identified by a unique number in this message. The remainder of the message consists of FP input parameters for an AI send and FP output parameters for an AI receive. These message formats are documented in Appendix A.

3.3.3 Form Processor

The UIM of the Form Processor receives messages from the NTM, calls the appropriate FP procedure and sends the results back to the AI via the NTM.

3.4 Program Interrupts

This section does not apply to the detailed design of the Application Interface.

3.5 Timing and Sequencing Description

The Application Interface control logic is simple. First, the AI receives input parameters from an application and sends the parameters to the FP via the NTM. Then the AI receives output parameters from the FP via the NTM and returns them to the application. This is illustrated in the flow diatram in section 3.2.

3.6 Special Control Features

The detailed design of the Application Interface does not include any special control features as defined in the ICAM Documentation Standards manual.

3.7 Storage Allocation

This section does not apply to the AI.

3.8 Object Code Creation

The AI routines were compiled with an ANSI COBOL compiler under VAX/VMS. The source is portable to other compilers on machines such as the IBM.

3.9 Adaptation Data

The AI source is portable to other ANSI COBOL compilers.

3.10 Detailed Design Description

3.10.1 Main Program List

The following is a list of all "Main Programs" which are modules that are not called by any other module being documented here. These modules are either program entry points or, if they are hooked into another set of programs via subroutine calls, they are the points the external programs can call and therefore enter through. To differentiate between the two types of entry points, look at the individual Module Documentation (section 3.10.8) and look at Module Type for each of the Main Program modules listed. Note whether the routine is a Program, Subroutine, or Function. If it is a Program, it is truly a main program entry point. If not, then it is merely called by other programs not being documented here.

APPLICATION INTERFACE Main Program List

Module Name	Purpose
ADDELM	ADD ELEMENT
ADDFRM	ADD FORM
CHGLDV	CHANGE LOGICAL DEVICE
CLSFRM	CLOSE FORM
CLSLDV	CLOSE LOGICAL DEVICE
GDATA	GET DATA
GETATT	GET ATTRIBUTES
GETBAK	GET BACKGROUND
GETCUR	GET CURSOR
GPAGE	GET PAGE
GWINDO	GET WINDOW
INITFP	INITialize Form Processor
INITVT	INITIAL VTI
INQLDV	INQUIRE LOGICAL DEVICE
OISCR	OUTPUT / INPUT SCREEN
OPNFRM	OPEN FORM
OPNLDV	OPEN LOGICAL DEVICE
OUTSCR	OUTPUT SCREEN
PARFQN	PARSE FULLY QUALIFIED NAME
PDATA	PUT DATA
PMSGLC	PUT MESSAGE LINE CODE

APPLICATION INTERFACE Main Program List

Module Name	Purpose
PMSGLS	PUT MESSAGE LINE STRING
PUTATT	PUT ATTRIBUTES
PUTBAK	PUT BACKGROUND
PUTCUR	PUT CURSOR
PUTLOC	PUT CURSOR LOCATION
RMVPAG	REMOVE PAGE
RPLFRM	REPLACE FORM
TERMFP	EXIT FORM PROCESSOR
TERMVT	TERMINATE VTI

3.10.2 Module List

The following is a list of all the modules being documented here along with their purpose. Each module has a unique name, no matter what language it was written in.

APPLICATION INTERFACE Module List

Module Name	Purpose
ADDELM	ADD ELEMENT
ADDFRM	ADD FORM
CHGLDV	CHANGE LOGICAL DEVICE
CLSFRM	CLOSE FORM
CLSLDV	CLOSE LOGICAL DEVICE
GDATA	GET DATA
GDATLN	GET DATA LENGTH
GETATT	GET ATTRIBUTES
GETBAK	GET BACKGROUND
GETCUR	GET CURSOR
GETUIM	GET USER INTERFACE MONITOR AP
GPAGE	GET PAGE
GWINDO	GET WINDOW
INITFP	INITialize Form Processor
INITVT	INITIAL VTI
INQLDV	INQUIRE LOGICAL DEVICE
OISCR	OUTPUT / INPUT SCREEN
OPNFRM	OPEN FORM
OPNLDV	OPEN LOGICAL DEVICE
OUTSCR	OUTPUT SCREEN
PARFQN	PARSE FULLY QUALIFIED NAME

APPLICATION INTERFACE Module List

Module Name	Purpose
PDATA	PUT DATA
PMSGLC	PUT MESSAGE LINE CODE
PMSGLS	PUT MESSAGE LINE STRING
PUTATT	PUT ATTRIBUTES
PUTBAK	PUT BACKGROUND
PUTCUR	PUT CURSOR
PUTLOC	PUT CURSOR LOCATION
RMVPAG	REMOVE PAGE
RPLFRM	REPLACE FORM
TERMFP	EXIT FORM PROCESSOR
TERMVT	TERMINATE VTI

3.10.3 External Routines List

The following is a list of all routines or functions not documented here that are called by modules that are documented here. The first caller, in alphabetical order, is listed as well. The specification in which any module is documented may be found in the Module Documentation Index (Document Number CM 620100001). See section 3.10.6 for a list of the modules that call each of these external routines.

APPLICATION INTERFACE External Routines List

Module Name	First User
APACCT	GETUIM
MEMCPY	GETUIM
NSEND	PUTLOC
RCV	TERMVT

3.10.4 Include File List

The following is a list of all include files called in by modules being documented here. Each include file has a unique name regardless of the language being used. The purpose of each include file is listed as well. A more complete description of each include file is given in section 3.10.9. The purpose listed is the one that is in the source code of the include file.

A purpose of "**** PURPOSE NOT FOUND BY STRIPPER ****" indicates that a purpose statement was not written into the include file itself. The most common reason for this is that the include file comes from system libraries that were not developed by the project, such as 'C' libraries that are provided with the 'C' compiler.

See section 3.10.6 for a set of lists which show all the modules which call in each of these include files.

APPLICATION INTERFACE Include File List

File Name	Purpose
FPCODE	Form Processor return codes
NAPIEVB	CORRECTED C VERSION OF APIEVB.INC
NAPINME	CORRECTED C VERSION OF APINME.INC
NBUFAPI	CORRECTED C VERSION OF BUFAPI.INC
ROUTID	ROUTine ID definitions
SRVRET	AS THE RETURN GIVEN A TABLE-FULL ERROR
STDTYP	STANDARD TYPE DEFINITIONS

3.10.5 Where Include File Used List

The following lists each include file from 3.10.4 and all the modules documented in this specification which include them. The purpose of each module is listed as well.

APPLICATION INTERFACE Where-include-file-used List

Include File	Module Name	Module Purpose
FPCODE		
	ADDELM	ADD ELEMENT
	ADDFRM	ADD FORM
	CHGLDV	CHANGE LOGICAL DEVICE
	CLSFRM	CLOSE FORM
	CLSLDV	CLOSE LOGICAL DEVICE
	GDATA	GET DATA
	GDATLN	GET DATA LENGTH
	GETATT	GET ATTRIBUTES
	GETBAK	GET BACKGROUND
	GETCUR	GET CURSOR
	GPAGE	GET PAGE
	GWINDO	GET WINDOW
	INITVT	INITIAL VTI
	INQLDV	INQUIRE LOGICAL DEVICE
	OISCR	OUTPUT / INPUT SCREEN
	OPNFRM	OPEN FORM
	OPNLDV	OPEN LOGICAL DEVICE
	OUTSCR	OUTPUT SCREEN
	PARFQN	PARSE FULLY QUALIFIED NAME
	PDATA	PUT DATA
	PMSGLC	PUT MESSAGE LINE CODE
	PMSGLS	PUT MESSAGE LINE STRING
	PUTATT	PUT ATTRIBUTES
	PUTBAK	PUT BACKGROUND
	PUTCUR	PUT CURSOR
	PUTLOC	PUT CURSOR LOCATION
	RMVPAG	REMOVE PAGE
	RPLFRM	REPLACE FORM
	TERMVT	TERMINATE VTI
NAPIEVB		
	GETUIM	GET USER INTERFACE MONITOR AP

APPLICATION INTERFACE Where-include-file-used List

Include File	Module Name	Module Purpose
NAPINME		
	GETUIM	GET USER INTERFACE MONITOR AP
NBUFAPI		
	GETUIM	GET USER INTERFACE MONITOR AP
ROUTID		
	ADDELM	ADD ELEMENT
	ADDFRM	ADD FORM
	CHGLDV	CHANGE LOGICAL DEVICE
	CLSFRM	CLOSE FORM
	CLSLDV	CLOSE LOGICAL DEVICE
	GDATA	GET DATA
	GDATLN	GET DATA LENGTH
	GETATT	GET ATTRIBUTES
	GETBAK	GET BACKGROUND
	GETCUR	GET CURSOR
	GPAGE	GET PAGE
	GWINDO	GET WINDOW
	INITVT	INITIAL VTI
	INQLDV	INQUIRE LOGICAL DEVICE
	OISCR	OUTPUT / INPUT SCREEN
	OPNFRM	OPEN FORM
	OPNLDV	OPEN LOGICAL DEVICE
	OUTSCR	OUTPUT SCREEN
	PARFQN	PARSE FULLY QUALIFIED NAME
	PDATA	PUT DATA
	PMSGLC	PUT MESSAGE LINE CODE
	PMSGLS	PUT MESSAGE LINE STRING
	PUTATT	PUT ATTRIBUTES
	PUTBAK	PUT BACKGROUND
	PUTCUR	PUT CURSOR
	PUTLOC	PUT CURSOR LOCATION
	RMVPAG	REMOVE PAGE

APPLICATION INTERFACE Where-include-file-used List

Include File	Module Name	Module Purpose
	RPLFRM	REPLACE FORM
	TERMVT	TERMINATE VTI
SRVRET		
	ADDELM	ADD ELEMENT
	ADDFRM	ADD FORM
	CHGLDV	CHANGE LOGICAL DEVICE
	CLSFRM	CLOSE FORM
	CLSLDV	CLOSE LOGICAL DEVICE
	GDATA	GET DATA
	GDATLN	GET DATA LENGTH
	GETATT	GET ATTRIBUTES
	GETBAK	GET BACKGROUND
	GETCUR	GET CURSOR
	GPAGE	GET PAGE
	GWINDO	GET WINDOW
	INITVT	INITIAL VTI
	INQLDV	INQUIRE LOGICAL DEVICE
	OISCR	OUTPUT / INPUT SCREEN
	OPNFRM	OPEN FORM
	OPNLDV	OPEN LOGICAL DEVICE
	OUTSCR	OUTPUT SCREEN
	PARFQN	PARSE FULLY QUALIFIED NAME
	PDATA	PUT DATA
	PMSGLC	PUT MESSAGE LINE CODE
	PMSGLS	PUT MESSAGE LINE STRING
	PUTATT	PUT ATTRIBUTES
	PUTBAK	PUT BACKGROUND
	PUTCUR	PUT CURSOR
	PUTLOC	PUT CURSOR LOCATION
	RMVPAG	REMOVE PAGE
	RPLFRM	REPLACE FORM
	TERMVT	TERMINATE VTI

APPLICATION INTERFACE Where-include-file-used List

Include	Module	Module
File	Name	Purpose
STDTYP		
	GETUIM	GET USER INTERFACE MONITOR AP

3.10.6 Where External Routine Used List

The following lists each external function or routine listed in 3.10.3 and all the documented modules which call it. The purpose of each module is listed as well.

APPLICATION INTERFACE Where-external-routine-used List

System Module	Module Name	Module Purpose
APACCT		
	GETUIM	GET USER INTERFACE MONITOR AP
MEMCPY		
	GETUIM	GET USER INTERFACE MONITOR AP
NSEND		
	ADDELM	ADD ELEMENT
	ADDFRM	ADD FORM
	CHGLDV	CHANGE LOGICAL DEVICE
	CLSFRM	CLOSE FORM
	CLSLDV	CLOSE LOGICAL DEVICE
	GDATA	GET DATA
	GDATLN	GET DATA LENGTH
	GETATT	GET ATTRIBUTES
	GETBAK	GET BACKGROUND
	GETCUR	GET CURSOR
	GPAGE	GET PAGE
	GWINDO	GET WINDOW
	INITVT	INITIAL VTI
	INQLDV	INQUIRE LOGICAL DEVICE
	OISCR	OUTPUT / INPUT SCREEN
	OPNFRM	OPEN FORM
	OPNLDV	OPEN LOGICAL DEVICE
	OUTSCR	OUTPUT SCREEN
	PARFQN	PARSE FULLY QUALIFIED NAME
	PDATA	PUT DATA
	PMSGLC	PUT MESSAGE LINE CODE
	PMSGLS	PUT MESSAGE LINE STRING
	PUTATT	PUT ATTRIBUTES
	PUTBAK	PUT BACKGROUND
	PUTCUR	PUT CURSOR
	PUTLOC	PUT CURSOR LOCATION
	RMVPAG	REMOVE PAGE
	RPLFRM	REPLACE FORM
	TERMVT	TERMINATE VTI

APPLICATION INTERFACE Where-external-routine-used List

System Module	Module Name	Module Purpose
RCV		
	ADDELM	ADD ELEMENT
	ADDFRM	ADD FORM
	CHGLDV	CHANGE LOGICAL DEVICE
	CLSFRM	CLOSE FORM
	CLSLDV	CLOSE LOGICAL DEVICE
	GDATA	GET DATA
	GDATLN	GET DATA LENGTH
	GETATT	GET ATTRIBUTES
	GETBAK	GET BACKGROUND
	GETCUR	GET CURSOR
	GPAGE	GET PAGE
	GWINDO	GET WINDOW
	INITVT	INITIAL VTI
	INQLDV	INQUIRE LOGICAL DEVICE
	OISCR	OUTPUT / INPUT SCREEN
	OPNFRM	OPEN FORM
	OPNLDV	OPEN LOGICAL DEVICE
	OUTSCR	OUTPUT SCREEN
	PARFQN	PARSE FULLY QUALIFIED NAME
	PDATA	PUT DATA
	PUTATT	PUT ATTRIBUTES
	PUTBAK	PUT BACKGROUND
	PUTCUR	PUT CURSOR
	PUTLOC	PUT CURSOR LOCATION
	RMVPAG	REMOVE PAGE
	RPLFRM	REPLACE FORM
	TERMVT	TERMINATE VTI

3.10.7 Main Program Parts List

The following lists each Main Program listed in 3.10.1 and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more that once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external "routine". The Purpose of the Main Program module is listed as well.

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
ADDELM		Purpose--›ADD ELEMENT
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

```
Main Pgm   Module               Module
Name       Name                 Type
--------   ------               ------

ADDFRM              Purpose-->ADD FORM
           APACCT               External routine
           GETUIM               Well-defined module
           MEMCPY               External routine
           NSEND                External routine
           RCV                  External routine
```

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
CHGLDV	Purpose--›	CHANGE LOGICAL DEVICE
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
CLSFRM		Purpose-->CLOSE FORM
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

```
Main Pgm    Module             Module
Name        Name               Type
--------    ------             ------

CLSLDV                Purpose-->CLOSE LOGICAL DEVICE
            APACCT             External routine
            GETUIM             Well-defined module
            MEMCPY             External routine
            NSEND              External routine
            RCV                External routine
```

APPLICATION INTERFACE Main Program Parts List

```
Main Pgm   Module             Module
Name       Name               Type
---------  ------             ------

GDATA                Purpose-->GET DATA
           APACCT             External routine
           GETUIM             Well-defined module
           MEMCPY             External routine
           NSEND              External routine
           RCV                External routine
```

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
GETATT		Purpose--›	GET ATTRIBUTES
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
GETBAK		Purpose-->	GET BACKGROUND
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
GETCUR		Purpose--›	GET CURSOR
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
GPAGE		Purpose-->GET PAGE
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
GWINDO		Purpose--›	GET WINDOW
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
INITVT		Purpose-->INITIAL VTI
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
INQLDV		Purpose--›	INQUIRE LOGICAL DEVICE
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
OISCR		Purpose--›	OUTPUT / INPUT SCREEN
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

```
Main Pgm   Module               Module
Name       Name                 Type
--------   ------               ------

OPNFRM               Purpose-->OPEN FORM
           APACCT               External routine
           GETUIM               Well-defined module
           MEMCPY               External routine
           NSEND                External routine
           RCV                  External routine
```

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
OPNLDV		Purpose--›	OPEN LOGICAL DEVICE
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
OUTSCR		Purpose-->OUTPUT SCREEN
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
PARFQN		Purpose--›PARSE FULLY QUALIFIED NAME
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
PDATA		Purpose--›	PUT DATA
	APACCT		External routine
	GDATLN		Well-defined module
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
PMSGLC		Purpose--›	PUT MESSAGE LINE CODE
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
PMSGLS		Purpose-->PUT MESSAGE LINE STRING
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name --------	Module Name ------		Module Type ------
PUTATT		Purpose--›	PUT ATTRIBUTES
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
PUTBAK		Purpose-->	PUT BACKGROUND
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name	Module Type
PUTCUR		Purpose--›PUT CURSOR
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
PUTLOC		Purpose--›	PUT CURSOR LOCATION
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm	Module	Module
Name	Name	Type
RMVPAG		Purpose--›REMOVE PAGE
	APACCT	External routine
	GETUIM	Well-defined module
	MEMCPY	External routine
	NSEND	External routine
	RCV	External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
RPLFRM		Purpose--›	REPLACE FORM
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

APPLICATION INTERFACE Main Program Parts List

Main Pgm Name	Module Name		Module Type
TERMVT		Purpose--›	TERMINATE VTI
	APACCT		External routine
	GETUIM		Well-defined module
	MEMCPY		External routine
	NSEND		External routine
	RCV		External routine

3.10.8 Module Documentation

The following documentation describes information which is specific to each individual module being documented in this specification as listed in section 3.10.2. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME: Name of program Module.

PURPOSE: Purpose of Module as detailed in the source code.

LANGUAGE: Programming language source code is written in.
The choices are:
VAX-11 FORTRAN
C (I/S-1 Workbench 'C')
VAX-11 COBOL

MODULE TYPE: Whether a Program, Subroutine, or Function.

SOURCE FILE: Name of Source File from file specification.

SOURCE FILE TYPE: Source File Extension from file specification.

HOST: Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.

SUBSYSTEM: IISS sub-system this file resides in.

SUBDIRECTORY: Sub-directory of that subsystem in which this file resides.

DOCUMENTATION GROUP: Name of documentation group of which this source file is a member.

DESCRIPTION: A description of the module as otained from the source code.

ARGUMENTS: The arguments with which this routine is called if it is a Subroutine or a Function.

INCLUDE FILES: A list of all the files that are included into this module as well as their purposes.

ROUTINES CALLED: Subroutines or Functions, either documented or external, called by this module, if any.

CALLED DIRECTLY BY: The documented routines which call this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which contain this module in their parts list according to the list in section 3.10.7.

The Module Documentation is arranged alphabetically according to Module Name.

APPLICATION INTERFACE Module Documentation

NAME:	ADDELM
PURPOSE:	ADD ELEMENT
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	ADDELM

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	ADDFRM
PURPOSE:	ADD FORM
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	ADDFRM

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

APPLICATION INTERFACE Module Documentation

NAME:	CHGLDV
PURPOSE:	CHANGE LOGICAL DEVICE
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	CHGLDV

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

APPLICATION INTERFACE Module Documentation

```
NAME:                    CLSFRM
PURPOSE:                 CLOSE FORM
LANGUAGE:                VAX-11 COBOL
MODULE TYPE:             PROGRAM
SOURCE FILE:             CLSFRM

DESCRIPTION:
------------


INCLUDE FILES:
--------------
  FPCODE      - Form Processor return codes
  ROUTID      - ROUTine ID definitions
  SRVRET      - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:
----------------
  GETUIM      - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	CLSLDV
PURPOSE:	CLOSE LOGICAL DEVICE
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	CLSLDV

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	GDATA
PURPOSE:	GET DATA
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	GDATA

```
DESCRIPTION:
------------


INCLUDE FILES:
--------------
  FPCODE     - Form Processor return codes
  ROUTID     - ROUTine ID definitions
  SRVRET     - AS THE RETURN GIVEN A TABLE-FULL ERROR


ROUTINES CALLED:
----------------
  GETUIM     - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	GDATLN
PURPOSE:	GET DATA LENGTH
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	GDATLN

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

CALLED DIRECTLY BY:

PDATA	- PUT DATA

USED IN MAIN PROGRAM(S):

PDATA	- PUT DATA

APPLICATION INTERFACE Module Documentation

```
NAME:                  GETATT
PURPOSE:               GET ATTRIBUTES
LANGUAGE:              VAX-11 COBOL
MODULE TYPE:           PROGRAM
SOURCE FILE:           GETATT

DESCRIPTION:
------------


INCLUDE FILES:
--------------
  FPCODE     - Form Processor return codes
  ROUTID     - ROUTine ID definitions
  SRVRET     - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:
----------------
  GETUIM     - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

```
APPLICATION INTERFACE Module Documentation

NAME:                    GETBAK
PURPOSE:                 GET BACKGROUND
LANGUAGE:                VAX-11 COBOL
MODULE TYPE:             PROGRAM
SOURCE FILE:             GETBAK

DESCRIPTION:
------------


INCLUDE FILES:
--------------
  FPCODE      - Form Processor return codes
  ROUTID      - ROUTine ID definitions
  SRVRET      - AS THE RETURN GIVEN A TABLE-FULL ERROR


ROUTINES CALLED:
----------------
  GETUIM      - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	GETCUR
PURPOSE:	GET CURSOR
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	GETCUR

DESCRIPTION:

INCLUDE FILES:

```
  FPCODE     - Form Processor return codes
  ROUTID     - ROUTine ID definitions
  SRVRET     - AS THE RETURN GIVEN A TABLE-FULL ERROR
```

ROUTINES CALLED:

```
  GETUIM     - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	GETUIM
PURPOSE:	GET USER INTERFACE MONITOR AP
LANGUAGE:	C
MODULE TYPE:	FUNCTION
FUNCTION TYPE:	FORTRAN VOID ()
SOURCE FILE:	GETUIM
SOURCE FILE TYPE:	.C
HOST:	
SUBSYSTEM:	UI
SUBDIRECTORY:	FPAI
DOCUMENTATION GROUP:	FPAI

DESCRIPTION:

SYNOPSIS

```
FORTRAN VOID GETUIM(UIAPNM, UICHAN, RCODE)
   CHAR UIAPNM[APNAM_LEN], UICHAN[LCHAN_LEN],
                RCODE[RCODE_LEN];
```

OUTPUTS:

UIAPNM	- AP NAME OF UIM
UICHAN	- LOGICAL CHANNEL FOR UIM
RCODE	- RETURN CODE

DESCRIPTION

RETURNS THE AP NAME AND LOGICAL CHANNEL OF THE USER INTERFACE MONITOR.

ARGUMENTS:

UIAPNM =	CHAR [APNAM_LEN]
UICHAN =	CHAR [LCHAN_LEN]
RCODE =	CHAR [RCODE_LEN]

INCLUDE FILES:

STDTYP	- STANDARD TYPE DEFINITIONS
NAPINME	- CORRECTED C VERSION OF APINME.INC
NBUFAPI	- CORRECTED C VERSION OF BUFAPI.INC
NAPIEVB	- CORRECTED C VERSION OF APIEVB.INC

ROUTINES CALLED:

APACCT
MEMCPY

CALLED DIRECTLY BY:

ADDELM	- ADD ELEMENT
ADDFRM	- ADD FORM
CHGLDV	- CHANGE LOGICAL DEVICE
CLSFRM	- CLOSE FORM
CLSLDV	- CLOSE LOGICAL DEVICE
GDATA	- GET DATA
GDATLN	- GET DATA LENGTH
GETATT	- GET ATTRIBUTES
GETBAK	- GET BACKGROUND
GETCUR	- GET CURSOR
GPAGE	- GET PAGE
GWINDO	- GET WINDOW
INITVT	- INITIAL VTI
INQLDV	- INQUIRE LOGICAL DEVICE
OISCR	- OUTPUT / INPUT SCREEN
OPNFRM	- OPEN FORM
OPNLDV	- OPEN LOGICAL DEVICE
OUTSCR	- OUTPUT SCREEN
PARFQN	- PARSE FULLY QUALIFIED NAME
PDATA	- PUT DATA
PMSGLC	- PUT MESSAGE LINE CODE
PMSGLS	- PUT MESSAGE LINE STRING
PUTATT	- PUT ATTRIBUTES
PUTBAK	- PUT BACKGROUND
PUTCUR	- PUT CURSOR
PUTLOC	- PUT CURSOR LOCATION
RMVPAG	- REMOVE PAGE
RPLFRM	- REPLACE FORM
TERMVT	- TERMINATE VTI

USED IN MAIN PROGRAM(S):

ADDELM	- ADD ELEMENT
ADDFRM	- ADD FORM
CHGLDV	- CHANGE LOGICAL DEVICE
CLSFRM	- CLOSE FORM
CLSLDV	- CLOSE LOGICAL DEVICE

GDATA	-	GET DATA
GETATT	-	GET ATTRIBUTES
GETBAK	-	GET BACKGROUND
GETCUR	-	GET CURSOR
GPAGE	-	GET PAGE
GWINDO	-	GET WINDOW
INITVT	-	INITIAL VTI
INQLDV	-	INQUIRE LOGICAL DEVICE
OISCR	-	OUTPUT / INPUT SCREEN
OPNFRM	-	OPEN FORM
OPNLDV	-	OPEN LOGICAL DEVICE
OUTSCR	-	OUTPUT SCREEN
PARFQN	-	PARSE FULLY QUALIFIED NAME
PDATA	-	PUT DATA
PMSGLC	-	PUT MESSAGE LINE CODE
PMSGLS	-	PUT MESSAGE LINE STRING
PUTATT	-	PUT ATTRIBUTES
PUTBAK	-	PUT BACKGROUND
PUTCUR	-	PUT CURSOR
PUTLOC	-	PUT CURSOR LOCATION
RMVPAG	-	REMOVE PAGE
RPLFRM	-	REPLACE FORM
TERMVT	-	TERMINATE VTI

APPLICATION INTERFACE Module Documentation

NAME:	GPAGE
PURPOSE:	GET PAGE
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	GPAGE

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	GWINDO
PURPOSE:	GET WINDOW
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	GWINDO

DESCRIPTION:

INCLUDE FILES:

FPCODE	-	Form Processor return codes
ROUTID	-	ROUTine ID definitions
SRVRET	-	AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	-	GET USER INTERFACE MONITOR AP
NSEND		
RCV		

APPLICATION INTERFACE Module Documentation

NAME:	INITFP
PURPOSE:	INITialize Form Processor
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	INITFP

DESCRIPTION:

APPLICATION INTERFACE Module Documentation

NAME:	INITVT
PURPOSE:	INITIAL VT1
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	INITVT

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	INQLDV
PURPOSE:	INQUIRE LOGICAL DEVICE
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	INQLDV

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	OISCR
PURPOSE:	OUTPUT / INPUT SCREEN
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	OISCR

DESCRIPTION:

INCLUDE FILES:

```
  FPCODE      - Form Processor return codes
  ROUTID      - ROUTine ID definitions
  SRVRET      - AS THE RETURN GIVEN A TABLE-FULL ERROR
```

ROUTINES CALLED:

```
  GETUIM      - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	OPNLDV
PURPOSE:	OPEN LOGICAL DEVICE
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	OPNLDV

DESCRIPTION:

INCLUDE FILES:

```
  FPCODE     - Form Processor return codes
  ROUTID     - ROUTine ID definitions
  SRVRET     - AS THE RETURN GIVEN A TABLE-FULL ERROR
```

ROUTINES CALLED:

```
  GETUIM     - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	OUTSCR
PURPOSE:	OUTPUT SCREEN
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	OUTSCR

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	PARFQN
PURPOSE:	PARSE FULLY QUALIFIED NAME
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	PARFQN

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	PDATA
PURPOSE:	PUT DATA
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	PDATA

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GDATLN	- GET DATA LENGTH
GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

APPLICATION INTERFACE Module Documentation

```
NAME:                   PMSGLC
PURPOSE:                PUT MESSAGE LINE CODE
LANGUAGE:               VAX-11 COBOL
MODULE TYPE:            PROGRAM
SOURCE FILE:            PMSGLC

DESCRIPTION:
------------


INCLUDE FILES:
--------------
  FPCODE      - Form Processor return codes
  ROUTID      - ROUTine ID definitions
  SRVRET      - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:
----------------
  GETUIM      - GET USER INTERFACE MONITOR AP
  NSEND
```

APPLICATION INTERFACE Module Documentation

NAME:	PMSGLS
PURPOSE:	PUT MESSAGE LINE STRING
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	PMSGLS

DESCRIPTION:

INCLUDE FILES:

```
  FPCODE      - Form Processor return codes
  ROUTID      - ROUTine ID definitions
  SRVRET      - AS THE RETURN GIVEN A TABLE-FULL ERROR
```

ROUTINES CALLED:

```
  GETUIM      - GET USER INTERFACE MONITOR AP
  NSEND
```

APPLICATION INTERFACE Module Documentation

NAME:	PUTATT
PURPOSE:	PUT ATTRIBUTES
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	PUTATT

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

```
NAME:                 PUTBAK
PURPOSE:              PUT BACKGROUND
LANGUAGE:             VAX-11 COBOL
MODULE TYPE:          PROGRAM
SOURCE FILE:          PUTBAK

DESCRIPTION:
------------

INCLUDE FILES:
--------------
  FPCODE       - Form Processor return codes
  ROUTID       - ROUTine ID definitions
  SRVRET       - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:
----------------
  GETUIM       - GET USER INTERFACE MONITOR AP
  NSEND
  RCV
```

APPLICATION INTERFACE Module Documentation

NAME:	PUTCUR
PURPOSE:	PUT CURSOR
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	PUTCUR

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	PUTLOC
PURPOSE:	PUT CURSOR LOCATION
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	PUTLOC

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

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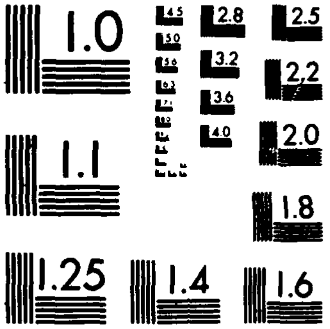
END
8-87
DTIC


1.0
4.5
5.0
5.6
6.3
7.1
8.0
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
1.1
1.25
1.4
1.6

APPLICATION INTERFACE Module Documentation

NAME:	RMVPAG
PURPOSE:	REMOVE PAGE
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	RMVPAG

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

APPLICATION INTERFACE Module Documentation

NAME:	RPLFRM
PURPOSE:	REPLACE FORM
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	RPLFRM

DESCRIPTION:

INCLUDE FILES:

FPCODE - Form Processor return codes
ROUTID - ROUTine ID definitions
SRVRET - AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM - GET USER INTERFACE MONITOR AP
NSEND
RCV

APPLICATION INTERFACE Module Documentation

NAME:	TERMFP
PURPOSE:	EXIT FORM PROCESSOR
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	TERMFP

DESCRIPTION:

APPLICATION INTERFACE Module Documentation

NAME:	TERMVT
PURPOSE:	TERMINATE VTI
LANGUAGE:	VAX-11 COBOL
MODULE TYPE:	PROGRAM
SOURCE FILE:	TERMVT

DESCRIPTION:

INCLUDE FILES:

FPCODE	- Form Processor return codes
ROUTID	- ROUTine ID definitions
SRVRET	- AS THE RETURN GIVEN A TABLE-FULL ERROR

ROUTINES CALLED:

GETUIM	- GET USER INTERFACE MONITOR AP
NSEND	
RCV	

3.10.9 Include File Descriptions

The following list contains a purpose and description of each include file listed in 3.10.4 as specified in the source code. The language it is written in is also given.

APPLICATION INTERFACE Include File Description

```
FILE NAME: FPCODE
PURPOSE:   Form Processor return codes
LANGUAGE:  VAX-11 COBOL

DESCRIPTION:
------------
```

APPLICATION INTERFACE Include File Description

FILE NAME: NAPIEVB
PURPOSE: CORRECTED C VERSION OF APIEVB.INC
LANGUAGE: C

DESCRIPTION:

APPLICATION INTERFACE Include File Description

```
FILE NAME: NAPINME
PURPOSE:   CORRECTED C VERSION OF APINME.INC
LANGUAGE:  C

DESCRIPTION:
------------

  DESCRIPTION
     APIS GLOBAL NAME DATA.
```

APPLICATION INTERFACE Include File Description

FILE NAME: NBUFAPI
PURPOSE: CORRECTED C VERSION OF BUFAPI.INC
LANGUAGE: C

DESCRIPTION:

APPLICATION INTERFACE Include File Description

FILE NAME: ROUTID
PURPOSE: ROUTine ID definitions
LANGUAGE: VAX-11 COBOL

```
DESCRIPTION:
-------------

  DESCRIPTION: THIS INCLUDE MEMBER CONTAINS THE ROUTINE ID
           DEFINITIONS FOR MESSAGING BETWEEN THE FPAI
           AND THE FP.

  INFORMATION:
     TYPE: (C-COBOL, IC-COBOL COPY) IC
     SUBSYSTEM: UI
     CONFIGURATION ITEM ID:

     DESIGNED BY: A. J. WEHRMAN
     START DATE: 8/8/85
     FINISH DATE: 8/8/85

     PROGRAMMED BY: A. J. WEHRMAN
     START DATE: 8/8/85
     FINISH DATE: 8/8/85
```

APPLICATION INTERFACE Include File Description

```
FILE NAME: SRVRET
PURPOSE:   AS THE RETURN GIVEN A TABLE-FULL ERROR
LANGUAGE:  VAX-11 COBOL

DESCRIPTION:
------------
   MODIFIED 11/2/83 TO INCLUDE RET-CODE-5                          *
   MODIFIED 1/9/84 TO INCREASE ALL ERROR CODES TO PIC X(5)         *
     AND TO ELIMINATE ALPHA'S                                      *
   MODIFIED 1/26/84 TO ADD RET-CODE FOR GETUSR-NOT-SUCC            *
   SRV-SUCCESSFUL ADDED FOR GENERIC RETURN                         *
   MODIFIED 2/7/84 TO ADD ERROR CODES FOR ENTRY-NOT-FOUND          *
   MODIFIED 2/8/84 TO ADD WHTHST-NOT-SUCCESSFUL                    *
   MODIFIED 2/20/84 TO ADD TSTMOD NEW CODES.                       *
      MODIFIED 20 AUG 84 INITALIZE ALL LOCAL VARAIBLES TO
               SPACES OR 0.
   MODIFIED 5/21/85 TO ADD RCL AND FILGEN RETURN CODES
```

APPLICATION INTERFACE Include File Description

FILE NAME: STDTYP
PURPOSE: STANDARD TYPE DEFINITIONS
LANGUAGE: C

DESCRIPTION:

```
  DESCRIPTION
     THIS FILE ENSURES THAT THE FOLLOWING STANDARD TYPES ARE
                     AVAILABLE:
        FLOAT     - SINGLE PRECISION FLOAT
        DOUBLE    - DOUBLE PRECISION FLOAT

        LONG      - 32 BIT (OR LARGER) SIGNED INTEGER
        LBITS     - 32 BITS (OR MORE) FOR BIT MANIPULATION

        INT       - NATURAL SIZE SIGNED INTEGER
        UNSIGNED  - NATURAL SIZE UNSIGNED INTEGER
        BOOL      - NATURAL SIZE LOGICAL (ZERO / NON-ZERO ONLY)

        SHORT     - 16 BIT (OR LARGER) SIGNED INTEGER
        USHORT    - 16 BIT (OR LARGER) UNSIGNED INTEGER
        BITS      - 16 BITS (OR MORE) FOR BIT MANIPULATION

        CHAR      - SINGLE MACHINE CHARACTER (REAL CHARACTERS
                      ALWAYS POSITIVE)
        TINY      - 8 BIT (OR LARGER) SIGNED INTEGER
        UTINY     - 8 BIT (OR LARGER) UNSIGNED INTEGER
        TBITS     - 8 BITS (OR MORE) FOR BIT MANIPULATION
        TBOOL     - 8 BIT (OR LARGER) LOGICAL (ZERO / NON-ZERO
                      ONLY)

        METACHAR  - 16 BIT (OR LARGER) AUGMENTED CHARACTER
                      (SIGNED)

        VOID      - FUNCTION THAT RETURNS NO VALUE

        FORTRAN   - STORAGE CLASS FOR FOREIGN (NON-C) ROUTINES
                      OR C ROUTINES
                    WHICH ARE CALLABLE FROM FOREIGN ROUTINES

     SINCE NOT ALL COMPILERS SUPPORT USHORT, TINY, AND UTINY,
                     THE FUNCTIONS
```

```
USHORT(), TINY(), AND UTINY() SHOULD BE USED WHENEVER
                REFERENCING THEM.

IN ADDITION, THE FOLLOWING UTILITY MACROS ARE DEFINED:
   LURSHIFT(N, B) - UNSIGNED LONG RIGHT SHIFT
   MAX(A, B)      - MAXIMUM OF A AND B
   MIN(A, B)      - MINIMUM OF A AND B
```

APPLICATION INTERFACE Include File Description

```
     ABS(A)            - ABSOLUTE VALUE OF A
     STRASN(A, B)      - TRANSPORTABLE A = B FOR STRUCTURES
     NULL              - NULL POINTER VALUE (0)
     TRUE              - 1
     FALSE             - 0
     SUCCESS           - EXIT(SUCCESS) INDICATES SUCCESSFUL
                    COMPLETION
     FAILURE           - EXIT(FAILURE) INDICATES ERRORS

  THE FOLLOWING SYMBOLS SHOULD BE DEFINED BASED ON THE
                    COMPILER BEING USED:
     USHORT  - COMPILER SUPPORTS UNSIGNED SHORT
     TINY    - COMPILER TREATS CHAR AS SIGNED
     UTINY   - CHAR IS SIGNED AND COMPILER SUPPORTS
                    UNSIGNED CHAR
     VOID    - COMPILER SUPPORTS VOID
     FORTRAN - COMPILER SUPPORTS FORTRAN
     STRASN  - DEFINE APPROPRIATE MACRO
     SUCCESS - DEFINE APPROPRIATE VALUE IF NOT 0
     FAILURE - DEFINE APPROPRIATE VALUE IF NOT 1
```

APPENDIX A

FP/AI MESSAGE FORMATS

The following is a COBOL declaration of the message formats used between the AI and the FP.

FP to AI message formats, FP output parameters.

NOTE: All 01 line records correspond to the FP routines being called. For example, ADDELM-FP-RECORD is used in the routine ADDELM.

```
01  ADDELM-FP-RECORD.
    05  ADDELM-ELEMENT-NUMBER    PIC 9(4).
    05  ADDELM-RCODE             PIC X(5).
01  ADDFRM-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  ADDFRM-PAGE-NUMBER       PIC 9(4).
    05  ADDFRM-RCODE             PIC X(5).
01  CHGLDV-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  CHGLDV-RCODE             PIC X(5).
01  CLSFRM-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  CLSFRM-RCODE             PIC X(5).
01  CLSLDV-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  CLSLDV-RCODE             PIC X(5).
01  GDATA-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GDATA-BUFFER-LENGTH      PIC 9(4).
    05  GDATA-RCODE              PIC X(5).
    05  GDATA-BUFFER             PIC X(4096).
01  GDATLN-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GDATLN-BUFFER-LENGTH     PIC 9(4).
    05  GDATLN-RCODE             PIC X(5).
01  GETATT-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GETATT-ATTRIBUTE         PIC X(10).
    05  GETATT-RCODE             PIC X(5).
01  GETBAK-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GETBAK-ATTRIBUTE         PIC X(10).
    05  GETBAK-RCODE             PIC X(5).
01  GETCUR-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GETCUR-FIELD-NAME        PIC X(120).
    05  GETCUR-FIELD-TYPE        PIC X.
    05  GETCUR-ROW               PIC 9(4).
    05  GETCUR-COL               PIC 9(4).
    05  GETCUR-RCODE             PIC X(5).
```

```
01  GPAGE-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GPAGE-FORM-NAME         PIC X(10).
    05  GPAGE-RCODE             PIC X(5).
01  GWINDO-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  GWINDO-TOTAL-PAGES      PIC 9(4).
    05  GWINDO-RCODE            PIC X(5).
01  INQLDV-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  INQLDV-LOG-DEV-ID       PIC 9(5).
    05  INQLDV-RCODE            PIC X(5).
01  OISCR-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  OISCR-FUNCTION          PIC 9(4).
    05  OISCR-RCODE             PIC X(5).
01  OPNFRM-FP-RECORD REDEFINES ADDELM-FP-RECORD.
    05  OPNFRM-RCODE            PIC X(5).
    01  OPNLDV-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  OPNLDV-LOG-DEV-ID       PIC 9(5).
        05  OPNLDV-RCODE            PIC X(5).
    01  OUTSCR-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  OUTSCR-RCODE            PIC X(5).
    01  PARFQN-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  PARFQN-PAR-NAME         PIC X(120).
        05  PARFQN-PAR-TYPE         PIC X.
        05  PARFQN-RCODE            PIC X(5).
    01  PDATA-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  PDATA-RCODE             PIC X(5).
    01  PUTATT-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  PUTATT-RCODE            PIC X(5).
    01  PUTBAK-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  PUTBAK-RCODE            PIC X(5).
    01  PUTCUR-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  PUTCUR-RCODE            PIC X(5).
    01  PUTLOC-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  PUTLOC-RCODE            PIC X(5).
    01  RMVPAG-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  RMVPAG-RCODE            PIC X(5).
    01  RPLFRM-FP-RECORD REDEFINES ADDELM-FP-RECORD.
        05  RPLFRM-RCODE            PIC X(5).
```

AI to FP message format, input parameters.

```
    01  INPUT-RECORD.
        05  ROUTINE-ID              PIC 99.
    01  ADDELM-FPAI-RECORD REDEFINES INPUT-RECORD.
        05  ROUTINE-ID              PIC 99.
        05  ADDELM-ELEMENT-NAME     PIC X(120).
```

```
01  ADDFRM-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  ADDFRM-WINDOW-NAME        PIC X(120).
    05  ADDFRM-FORM-NAME          PIC X(10).
01  CHGLDV-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  CHGLDV-LOG-DEV-ID         PIC 9(5).
01  CLSFRM-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  CLSFRM-FORM-NAME          PIC X(10).
01  CLSLDV-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  CLSLDV-LOG-DEV-ID         PIC 9(5).
01  GDATA-FPAI-RECORD REDEFINES  INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  GDATA-INSTANCE-ID         PIC 9(4).
    05  GDATA-FIELD-NAME          PIC X(120).
01  GDATLN-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  GDATLN-FIELD-NAME         PIC X(120).
01  GETATT-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  GETATT-FIELD-NAME         PIC X(120).
    05  GETATT-DURATION           PIC 9(4).
01  GETBAK-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  GETBAK-FIELD-NAME         PIC X(120).
    05  GETBAK-DURATION           PIC 9(4).
01  GETCUR-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
01  GPAGE-FPAI-RECORD REDEFINES  INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  GPAGE-WINDOW-NAME         PIC X(120).
    05  GPAGE-PAGE-NUMBER         PIC 9(4).
01  GWINDO-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  GWINDO-WINDOW-NAME        PIC X(120).
01  INQLDV-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
01  OISCR-FPAI-RECORD REDEFINES  INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  OISCR-WINDOW-NAME         PIC X(120).
01  OPNFRM-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  OPNFRM-FORM-NAME          PIC X(10).
01  OPNLDV-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
```

```
01  OUTSCR-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  OUTSCR-WINDOW-NAME        PIC X(120).
01  PARFQN-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PARFQN-FIELD-NAME         PIC X(120).
    05  PARFQN-FIELD-TYPE         PIC X.
    05  PARFQN-LEVEL              PIC 9(4).
01  PDATA-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PDATA-FIELD-NAME          PIC X(120).
    05  PDATA-BUFFER              PIC X(4096).
01  PMSGLC-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PMSGLC-MSG-CODE           PIC X(5).
01  PMSGLS-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PMSGLS-MSG-STRING         PIC X(60).
01  PUTATT-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PUTATT-FIELD-NAME         PIC X(120).
    05  PUTATT-DURATION           PIC 9(4).
    05  PUTATT-ATTRIBUTE          PIC X(10).
01  PUTBAK-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PUTBAK-FIELD-NAME         PIC X(120).
    05  PUTBAK-DURATION           PIC 9(4).
    05  PUTBAK-ATTRIBUTE          PIC X(10).
01  PUTCUR-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PUTCUR-FIELD-NAME         PIC X(120).
01  PUTLOC-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  PUTLOC-FIELD-NAME         PIC X(120).
    05  PUTLOC-ROW                PIC 9(4).
    05  PUTLOC-COL                PIC 9(4).
01  RMVPAG-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  RMVPAG-WINDOW-NAME        PIC X(120).
    05  RMVPAG-PAGE-NUMBER        PIC 9(4).
01  RPLFRM-FPAI-RECORD REDEFINES INPUT-RECORD.
    05  ROUTINE-ID                PIC 99.
    05  RPLFRM-WINDOW-NAME        PIC X(120).
    05  RPLFRM-PAGE-NUMBER        PIC 9(4).
    05  RPLFRM-FORM-NAME          PIC X(10).
```

3.10.10 Hierarchy Chart

The following hierarchy charts show the relationships between all of the modules mentioned in the above documentation. A module may call a subroutine several times within its code, but the call will only be shown once as a single relationship on this hierarchy chart. All modules shown at the top of the first page are considered Main Programs as described in section 3.10.1 above.

There is an internal paging scheme as marked by the numbers in the upper right corner of each page. An index after the last page of the chart shows where a routine and its calls are first defined. If a routine has no page reference, it either makes no calls or is an external routine. A continuation box on the end of a tree limb shows where that the tree continues on the page numbered mentioned. A number in a box with a routine name points to the page where the routine is further defined within the hierarchy tree. If there is no number in a box, the routine either makes no calls or is an external routine.

```
                                                                 1
+-------+  +-------+  +-------+  +-------+  +-------+  +-------+
|ADDELM|  |ADDFRM|  |CHGLDV|  |CLSFRM|  |CLSLDV|  |(CONT)|
+-----2+  +-----3+  +-----4+  +-----5+  +--+---+  +-----6+
                                              |
                                   +---------++-------+
                                   |          |        |
                                +--+---+   +--+--+  +-+-+
                                |GETUIM|   |NSEND|  |RCV|
                                +-----2+   +-----+  +---+
              +-------+
              |ADDELM|
              +--+----+
                 |
        +--------++--------+
        |         |        |
     +--+----+ +--+---+  +-+-+
     |GETUIM|  |NSEND|   |RCV|
     +--+----+ +------+  +---+
        |
   +----+-----+
   |          |
+--+----+  +--+----+
|APACCT|   |MEMCPY|
+-------+  +-------+
```

3

```
          +-------+
          |ADDFRM|
          +--+---+
             |
    +---------++--------+
    |          |        |
+--+---+   +--+--+   +-+-+
|GETUIM|   |NSEND|   |RCV|
+-----2+   +-----+   +---+
```

4

```
          +-------+
          |CHGLDV|
          +--+---+
             |
   +---------++--------+
   |          |        |
+--+---+   +--+--+   +-+-+
|GETUIM|   |NSEND|   |RCV|
+-----2+   +-----+   +---+
        +------+
        |CLSFRM|
        +--+---+
           |
   +-------++------+
   |        |      |
+--+---+ +--+--+ +-+-+
|GETUIM| |NSEND| |RCV|
+-----2+ +-----+ +---+
                                                           6
+-------+ +------+ +-------+ +-------+ +-------+ +-------+
|(CONT) | |GDATA | |GETATT | |GETBAK | |GETCUR | |(CONT) |
+------1+ +-----7+ +------8+ +------9+ +---+---+ +-----10+
                                           |
                                 +---------+-------+
                                 |         |       |
                              +--+-----+ +--+---+ +-+-+
                              |GETUIM  | |NSEND | |RCV|
                              +-------2+ +------+ +---+
           +------+
           |GDATA|
           +--+--+
               |
    +---------++--------+
    |           |         |
+--+---+    +--+--+    +-+-+
|GETUIM|    |NSEND|    |RCV|
+-----2+    +------+    +---+
         +------+
         |GETATT|
         +--+---+
            |
   +--------++--------+
   |         |        |
+--+---+  +--+--+   +-+-+
|GETUIM|  |NSEND|   |RCV|
+-----2+  +-----+   +---+
          +-------+
          |GETBAK|
          +--+---+
             |
   +---------++--------+
   |          |        |
+--+---+  +--+--+    +-+-+
|GETUIM|  |NSEND|    |RCV|
+-----2+  +-----+    +---+
                                                         10
+-------+ +------+ +-------+ +-------+ +-------+ +-------+
|(CONT) | |GPAGE | |GWINDO | |INITVT | |INQLDV | |(CONT) |
+------6+ +----11+ +-----12+ +-----13+ +---+---+ +-----14+
                                           |
                                 +---------++-------+
                                 |          |       |
                              +--+---+   +--+--+  +-+-+
                              |GETUIM|   |NSEND|  |RCV|
                              +-----2+   +-----+  +---+
```

11

```
         +-----+
         |GPAGE|
         +--+--+
            |
   +--------++-------+
   |         |       |
+--+---+  +--+--+  +-+-+
|GETUIM|  |NSEND|  |RCV|
+-----2+  +-----+  +---+
          +-------+
          |GWINDO |
          +--+----+
             |
   +---------++--------+
   |           |       |
+--+----+  +--+--+  +-+-+
|GETUIM |  |NSEND|  |RCV|
+------2+  +-----+  +---+
        +------+
        |INITVT|
        +--+---+
           |
   +-------++-------+
   |        |      |
+--+---+ +--+--+ +-+-+
|GETUIM| |NSEND| |RCV|
+-----2+ +-----+ +---+
                                                           14
+------+  +-----+  +------+  +------+  +------+  +------+
|(CONT)|  |OISCR|  |OPNFRM|  |OPNLDV|  |OUTSCR|  |(CONT)|
+----10+  +---15+  +----16+  +----17+  +--+---+  +----18+
                                          |
                                 +--------++-------+
                                 |         |       |
                              +--+---+  +--+--+  +-+-+
                              |GETUIM|  |NSEND|  |RCV|
                              +-----2+  +-----+  +---+
```

15

```
         +-----+
         |OISCR|
         +--+--+
            |
   +--------++-------+
   |         |       |
+--+---+  +--+--+  +-+-+
|GETUIM|  |NSEND|  |RCV|
+-----2+  +-----+  +---+
         +------+
         |OPNFRM|
         +--+---+
            |
   +--------++-------+
   |         |       |
+--+---+  +--+--+  +-+-+
|GETUIM|  |NSEND|  |RCV|
+-----2+  +-----+  +---+
        +------+
        |OPNLDV|
        +--+---+
           |
   +-------++-------+
   |        |       |
+--+---+ +--+--+  +-+-+
|GETUIM| |NSEND|  |RCV|
+-----2+ +-----+  +---+
                                                          18
+------+  +------+  +-----+  +------+  +------+  +------+
|(CONT)|  |PARFQN|  |PDATA|  |PMSGLC|  |PMSGLS|  |(CONT)|
+----14+  +----19+  +---20+  +----21+  +--+---+  +----22+
                                          |
                                     +----+----+
                                     |         |
                                  +--+---+  +--+--+
                                  |GETUIM|  |NSEND|
                                  +-----2+  +-----+
         +------+
         |PARFQN|
         +--+---+
            |
   +--------++-------+
   |         |       |
+--+---+  +--+--+  +-+-+
|GETUIM|  |NSEND|  |RCV|
+-----2+  +-----+  +---+
```

20

```
                     +-----+
                     |PDATA|
                     +--+--+
                        |
           +--------+---+-----+------+
           |        |         |      |
        +--+---+ +--+---+  +--+--+ +-+-+
        |GDATLN| |GETUIM|  |NSEND| |RCV|
        +--+---+ +-----2+  +-----+ +---+
           |
   +-------++-------+
   |        |       |
+--+---+ +--+--+  +-+-+
|GETUIM| |NSEND|  |RCV|
+-----2+ +-----+  +---+
     +------+
     |PMSGLC|
     +--+---+
        |
   +----+----+
   |         |
+--+---+  +--+--+
|GETUIM|  |NSEND|
+-----2+  +-----+
                                                            22
+------+  +------+  +------+  +------+  +------+  +------+
|(CONT)|  |PUTATT|  |PUTBAK|  |PUTCUR|  |PUTLOC|  |(CONT)|
+----18+  +----23+  +----24+  +----25+  +--+---+  +----26+
                                           |
                                  +--------++--------+
                                  |         |        |
                               +--+---+  +--+--+   +-+-+
                               |GETUIM|  |NSEND|   |RCV|
                               +-----2+  +-----+   +---+
         +------+
         |PUTATT|
         +--+---+
            |
   +--------++------+
   |         |      |
+--+---+  +--+--+ +-+-+
|GETUIM|  |NSEND| |RCV|
+-----2+  +-----+ +---+
         +--+---+
         |PUTBAK|
         +--+---+
            |
   +--------++--------+
   |         |        |
+--+---+  +--+--+   +-+-+
|GETUIM|  |NSEND|   |RCV|
+-----2+  +-----+   +---+
```

25

```
         +-------+
         |PUTCUR|
         +--+---+
             |
   +---------++-------+
   |          |       |
+--+---+   +--+--+  +-+-+
|GETUIM|   |NSEND|  |RCV|
+-----2+   +-----+  +---+
+------+ +------+ +------+                +------+
|(CONT)| |RMVPAG| |RPLFRM|                |TERMVT|
+----22+ +----27+ +--+---+                +--+---+
                     |                       |
             +-------++------+       +-------++------+
             |        |      |       |        |      |
          +--+---+ +--+--+ +-+-+  +--+---+ +--+--+ +-+-+
          |GETUIM| |NSEND| |RCV|  |GETUIM| |NSEND| |RCV|
          +-----2+ +-----+ +---+  +-----2+ +-----+ +---+
         +------+
         |RMVPAG|
         +--+---+
            |
   +--------++--------+
   |         |        |
+--+---+  +--+--+   +-+-+
|GETUIM|  |NSEND|   |RCV|
+-----2+  +-----+   +---+
```

3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

SECTION 4

QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."

U.S.Government Printing Office: 1987 — 748-061/60962

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